

**Claims:**

1. A method for purifying spent acid from an acid-catalyzed chemical  
5 reaction that generates a mixture of a product, spent acid and tar, comprising separating the mixture of product, spent acid, and tar into a product fraction and a spent acid fraction, said spent acid fraction comprising a mixture of spent acid and tar, and separating the spent acid fraction, by flotation separation, centrifugation, or liquid-liquid coalescence, into a tar fraction and  
10 a de-tarred spent acid fraction.
2. The method of claim 1, wherein the acid catalyzed chemical reaction comprises hydrating an olefin with water in the presence of a sulfuric acid catalyst and the product comprises an alkanol.  
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3. The process of claim 2, wherein the olefin comprises propylene and the product comprises isopropanol.
4. The process of claim 2, wherein the olefin comprises butene and the  
20 product comprises s-butanol.
5. The process of claim 4, further comprising dehydrogenating the s-butanol to form methyl ethyl ketone.
- 25 6. The method of claim 1, wherein the acid catalyzed chemical reaction comprises esterifying an acrylamide or methacrylamide salt with an alcohol in the presence of a sulfuric acid catalyst and the product comprises an acrylic ester or a methacrylic ester.

7. The process of claim 6, wherein the acrylamide or methacrylamide salt comprises methacrylamide sulfate, the alcohol comprises methanol, and the product comprises methyl acrylate or methyl methacrylate.
- 5 8. The method of claim 1, wherein the mixture of product, spent acid, and tar is separated into a product fraction and a spent acid fraction by steam stripping.
9. The method of claim 1, wherein the spent acid fraction is separated  
10 into a tar fraction and a de-tarred spent acid fraction by flotation.
10. The method of claim 1, wherein the spent acid fraction is separated into a tar fraction and a de-tarred spent acid fraction by centrifugation.
- 15 11. The method of claim 1, wherein the spent acid fraction is separated into a tar fraction and a de-tarred spent acid fraction by liquid-liquid coalescence.
12. The method of claim 1, further comprising fluidizing the tar fraction to  
20 provide fluidized tar.
13. The method of claim 12, wherein the tar fraction is fluidized by adding a carrier to the tar fraction.
- 25 14. The method of claim 12, wherein the tar fraction is fluidized by adding a surfactant to the tar fraction.
15. The method of claim 12, wherein the tar fraction is fluidized by adding sulfuric acid and a surfactant to the tar fraction.

16. The method of claim 12, further comprising incinerating the fluidized tar to produce sulfur dioxide.
17. The method of claim 16, further comprising oxidizing the sulfur dioxide to produce sulfur trioxide, and contacting the sulfur trioxide with a first sulfuric acid to produce a second sulfuric acid, wherein the second sulfuric acid has a higher sulfuric acid concentration than the first sulfuric acid.
18. The method of claim 17, further comprising recycling the second sulfuric acid as acid catalyst in the acid-catalyzed chemical reaction.
19. The method of claim 1, further comprising heating the de-tarred spent acid to form concentrated de-tarred sulfuric acid.
20. The method of claim 19, further comprising recycling the concentrated de-tarred sulfuric acid as acid catalyst in the acid-catalyzed chemical reaction.